

ABSTRACT

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The present invention relates to a zirconium alloy having excellent corrosion resistance and mechanical properties and a method for preparing a nuclear fuel cladding tube by zirconium alloy. More particularly, the present invention is directed to a zirconium alloy comprising $\text{Zr-aNb-bSn-cFe-dCr-eCu}$ ($a=0.05-0.4$ wt%, $b=0.3-0.7$ wt%, $c=0.1-0.4$ wt%, $d=0-0.2$ wt% and $e=0.01-0.2$ wt%, provided that $\text{Nb+Sn}=0.35-1.0$ wt%), and to a method for preparing a zirconium alloy nuclear fuel cladding tube, comprising melting a metal mixture comprising of the zirconium and alloying elements to obtain ingot, forging the ingot at β phase range, β -quenching the forged ingot at $1015-1075$ °C, hot-working the quenched ingot at $600-650$ °C, cold-working the hot-worked ingot in three to five passes, with intermediate vacuum annealing and final vacuum annealing the worked ingot at $460-540$ °C, which can be applied to the core components in a light water and a heavy water atomic reactor type nuclear power plant.